

REMARKS

The Office Action dated January 24, 2008 has been received and carefully noted. The above amendments to the claims, and the following remarks, are submitted as a full and complete response thereto.

Claims 1-26 and 31 have been amended to more particularly point out and distinctly claim the subject matter of the invention. Claims 27-30 have been cancelled without prejudice or disclaimer. Claim 32 has been added. No new matter has been added. Therefore, claims 1-26 and 31-32 are currently pending in the application and are respectfully submitted for consideration.

The Office Action rejected claims 1-12, 17, 18, and 21-31 under 35 U.S.C. §103(a) as being allegedly unpatentable as obvious over Leung (U.S. Patent No. 6,760,444) ("Leung") in view of Yegin, et al. (U.S. Patent No. 7,286,671) ("Yegin"). The Office Action took the position that Leung discloses all the elements of the claims with the exception of "the message being sent to correspondent node including the binding update," with respect to claims 1, 17, 26, and 31. The Office Action then cited Yegin as allegedly curing the deficiencies of Leung. (see e.g. Office Action at pages 2-3).

With respect to claims 27-30, Applicants respectfully submit that claims 27-30 have been cancelled, which moots the rejection with respect to those claims. With respect to claims 1-12, 17-18, 21-26, and 31, the rejection is respectfully traversed for at least the following reasons.

Claim 1, upon which claims 2-16 are dependent, recites a method, which includes indicating that a correspondent registration process needs to be performed for a mobile node for which a home network registration process has been performed or needs to be performed with its home network, thereby to register current network address of the mobile node with the home network. The correspondent registration process includes transmitting a binding update to a correspondent node of the mobile node. The binding update includes location-related information about the mobile node. The location-related information enables one of the correspondent node, or a third party to determine a geographic location of the mobile node within a certain accuracy. The method further includes authenticating the correspondent node in response to the indicating, the authenticating yielding identity information about the correspondent node, determining whether the correspondent registration process is to be carried out, based on the identity information, and performing the correspondent registration process when the determining indicates that the correspondent registration process is to be carried out and omitting the correspondent registration process when the determining indicates that the correspondent registration process is not to be carried out.

Claim 17, upon which claims 18-25 and 32 are dependent, recites an apparatus, which includes an indicator configured to give an indication when a correspondent registration process needs to be performed, and a binding unit configured to transmit a binding update to a correspondent node. The correspondent registration includes transmitting a binding update to the correspondent node. The binding update includes

location-related information about the apparatus. The location-related information enables one of the correspondent node, or a third party to determine a geographic location of the apparatus within a certain accuracy. The apparatus further includes an authenticator configured to authenticate the correspondent node, the authentication unit being responsive to the indicator and configured to yield identity information about the correspondent node . The apparatus further includes a location privacy decision unit, responsive to the authenticator, configured to determine whether the correspondent registration process is to be performed, and a correspondent registration unit, responsive to the location privacy decision unit, configured to carry out the correspondent registration process. The binding unit is further configured to perform a home network registration process with a home network of the apparatus, thereby to register current network address of the apparatus with the home network.

Claim 26 recites a system, which includes an indicator configured to give an indication when a correspondent registration process needs to be performed, location-related information about a mobile node being notified to a correspondent node of the mobile node if the correspondent registration process is performed. The system further includes a binding unit configured to transmit a binding update to the correspondent node. The correspondent registration includes transmitting a binding update to the correspondent node. The binding update includes location-related information about the mobile node. The location-related information enables one of the correspondent node, or a third party to determine a geographic location of the mobile node within a certain

accuracy. The system further includes an authenticator configured to authenticate the correspondent node, the authenticator being responsive to the indicator and yielding identity information about the correspondent node. The system further includes a location privacy decision unit, responsive to the authenticator, configured to determine, based on the identity information, whether the correspondent registration process is to be performed, and a correspondent registration unit, responsive to the location privacy decision unit, configured to carry out the correspondent registration process. The binding unit is further configured to perform a home network registration process with a home network of the mobile node, thereby to register current network address of the mobile node with the home network.

Claim 31 recites an apparatus, which includes indicator means for giving an indication when a correspondent registration process needs to be performed, and binding means for transmitting a binding update to the correspondent node and for performing a home network registration process with a home network of the apparatus, thereby to register current network address of the apparatus with the home network. The correspondent registration includes transmitting a binding update to the correspondent node, and wherein the binding update includes location-related information about the apparatus, and wherein the location-related information enables one of the correspondent node, or a third party to determine a geographic location of the apparatus within a certain accuracy. The apparatus further includes authentication means for authenticating the correspondent node, the authentication means being responsive to the indicator means

and yielding identity information about the correspondent node. The apparatus further includes location privacy decision means, responsive to the authentication means, for determining whether the correspondent registration process is to be performed, and correspondent registration means, responsive to the location privacy decision means, for carrying out the correspondent registration process.

According to embodiments of the invention, a mobile node is provided with reliable identity information that allows a decision to be made on whether or not a correspondent registration can be performed when a need for the registration has detected. The mobile node may thus allow the correspondent registration to be carried out only when the identity information indicates that the correspondent node will not misuse the location information that is made available when the continuation is allowed. A further advantage, according to embodiments of the invention, is that route optimization does not need to be omitted just because the mobile node cannot recognize a trusted correspondent node. This decreases the overhead caused in the network.

As will be discussed below, the combination of Leung and Yegin fails to disclose or suggest all of the elements of the claims, and therefore fails to provide the advantages and features discussed above.

Leung generally discloses a method and apparatus for authenticating a mobile node. A server is configured to provide a plurality of security associations associated with a plurality of mobile nodes. A packet identifying a mobile node may then be sent to the server from a network device such as a Home Agent. A security association for the

mobile node identified in the packet may then be obtained from the server. The security association may then be obtained from the server. The security association may be sent to the network device to permit authentication of the mobile node. (see Leung at Abstract).

Yegin generally discloses providing network-layer authentication protocols for authenticating a mobile client and an access router to teach outer. A mobile client sends out a solicitation message to request connectivity service. The solicitation message contains a proof of identity of the mobile client. An access router that receives the solicitation message will not respond to it until the proof of the identity of the mobile clients verified. Only when the proof of identity of the mobile client is verified, will the access router respond and return an advertising message to the mobile client. (see Yegin at Abstract).

Applicants respectfully submit that Leung and Yegin, whether considered individually or in combination, fail to disclose, teach, or suggest, all of the elements of the present claims. For example, the combination of Leung and Yegin fails to disclose, teach, or suggest, at least, “indicating that a correspondent registration process needs to be performed for a mobile node for which a home network registration process has been performed or needs to be performed with its home network, thereby to register current network address of the mobile node with the home network,” “wherein the correspondent registration process includes transmitting a binding update to a correspondent node of the mobile node,” “authenticating the correspondent node in response to the indicating, the

authenticating yielding identity information about the correspondent node,” and “determining whether the correspondent registration process is to be carried out, based on the identity information,” as recited in claim 1; and “an indicator configured to give an indication when a correspondent registration process needs to be performed, wherein the correspondent registration comprises transmitting a binding update to the correspondent node,” “an authenticator configured to authenticate the correspondent node, the authentication unit being responsive to the indicator and configured to yield identity information about the correspondent node,” “a correspondent registration unit, responsive to the location privacy decision unit, configured to carry out the correspondent registration process,” and “wherein the binding unit is further configured to perform a home network registration process with a home network of the apparatus, thereby to register current network address of the apparatus with the home network,” as recited in claim 17, and similarly recited in claims 26 and 31.

As discussed above, Leung discloses a method and apparatus for authenticating a mobile node. In the “Background of the Invention” section, Leung discloses a Mobile IP network which includes an internet (or WAN) 4, a Mobile Node 6, a Home Agent 8, and a Foreign Agent 10. Mobile Node 6 is based at a network segment 12 which allows it to communication over the internet 4 thorough a Home Agent 8. When Mobile Node 6 leaves its home base network segment 12 and roams to a remote network segment 14, Foreign Agent 10 relays a registration request to Home Agent 8. In response, Home Agent 8 updates an internal mobility binding table which specifics the care-of address

(i.e. the Foreign Agent's IP address) in association with the identity of Mobile Node 6. This has the effect of shifting the Mobile Node's home base IP address to the Foreign Agent's IP address. (see Leung at col. 1, line 37 – col. 2, line 20).

Leung further discloses that when Mobile Node 6 sends a message to a corresponding node 18, the Mobile Node 6 forwards the message through Foreign Agent 10 to corresponding node 18. If corresponding node 18 wishes to send a message to the Mobile Node 6, it sends a message which is forwarded ultimately to Home Agent 8. Home Agent 8 recognizes that Mobile Node 6 is no longer attached to network segment 12, encapsulates the packets according to a Mobile IP protocol and forwards the encapsulated packets to Foreign Agent 10. Foreign Agent 10 then strips the encapsulation and forwards the message to Mobile Node 6. (see Leung at col. 2, lines 21-46).

Applicants respectfully submit that Leung's disclosure of the Mobile Node 6 leaving its home base network segment 12 and roams to a remote network segment 14, where the Home Agent 8 shifts the Mobile Node's home base IP address to the Foreign Agent's IP address, as discussed above, merely discloses the known operation of Home and Foreign Agents in an Mobile IP network, when a mobile node moves away from its home network. Furthermore, Applicants respectfully submit that Leung's disclosure of the Mobile Node 6 sending a message to the corresponding node 18; and the corresponding node 18 sending a message to the Mobile Node 8 fails to disclose, or suggest, "indicating that a correspondent registration needs to be performed, wherein the

correspondent registration process includes transmitting a binding update to a correspondent node of a mobile node” because: (a) Leung fails to disclose or suggest that the Mobile Node 6, or the corresponding node 18, indicates that a correspondent registration is needed; (b) Leung fails to disclose or suggest that the Mobile Node 6, or the corresponding node 18, transmits a binding update; and (c) neither the Home Agent 8, nor the corresponding node 18, disclose a “corresponding node” as defined in the present application.

Furthermore, Leung’s disclosure of the registration of the care-of address of the Mobile Node 6 to the Home Agent 8 fails to disclose “indicating that a correspondent registration needs to be performed, wherein the correspondent registration process includes transmitting a binding update to a correspondent node of a mobile node” because said registration does not relate to correspondent registration, or sending a binding update to a correspondent node, because Leung is merely disclosing a known IP network procedure, which has nothing to do with a correspondent registration process.

Additionally, Leung discloses a Mobile Home Authentication process when a mobile node engages with a remote network segment. (see Leung at col. 2, lines 47-57). This does not relate to the authentication of a correspondent node, which is a separate process from the process disclosed in Leung. Furthermore, there is no disclosure or suggestion of determining whether the correspondent registration process is to be carried out, based on the identity information, because Leung merely discloses that the Home

Agent 8 proceeds to register the Mobile Node 6's new care-of-address without any determination process, whatsoever. (see Leung at col. 2, lines 10-30).

Thus, Leung discloses an operation between a mobile node and its home agent when the mobile node roams to a remote network segment. In contrast, embodiments of the present invention relates to correspondent registration, i.e. to a process during which a Binding Update is sent to a correspondent node, causing a binding for the mobile node to be registered at the correspondent node. Applicants respectfully submit that a mobile node that performs correspondent registration has already registered with its home agent located in the home network (i.e. performed the steps discussed in column 2, lines 1-30 of Leung) or will need to register with its home agent in connection with a correspondent registration.

Furthermore, Yegin does not cure the deficiencies of Leung. As discussed above, Yegin discloses an authentication protocol between a mobile node and an access router. With respect to claim 1, the Office Action refers to column 2, lines 11-13 of Yegin, which state that in Mobile IPv6, a client which is away from its home network sends a binding update to its home router and any correspondent node in communication. (see Office Action at page 3; Yegin at col. 2, lines 11-13). Applicants respectfully submit that the cited portion of Yegin, like the cited portion of Leung, merely discloses the known features of Mobile IPv6. In contrast, the present invention adds to the known features of Mobile IPv6. For example, the specification discloses that the problem behind relates to

the binding update sent to the correspondent node. (see e.g. Specification at paragraph 0004).

Thus, Applicants respectfully submit that the cited passages of Leung and Yegin that the Office Action relies on to reject the present claims disclose no more than known IP network procedures. In other words, Leung and Yegin disclose: (a) a procedure which allows the mobile node to be addressable at a care-of address when a mobile node roams away from its home network, and registers the care-of address with its home agent located in the home network; and (b) a procedure where the mobile node registers the care-of address with a correspondent node by sending a Binding Update message to the correspondent node. Both of these procedures are known and are discussed in the present application. (see e.g. Specification at paragraphs 0003 and 0021). Embodiments of the present invention go beyond these known procedures, and address the problem of where a mobile node does not have sufficient information to decide whether or not to initiate the correspondent registration. The cited portion of Leung and Yegin do not identify, or address, this problem.

The Office Action further stated that “it would have been obvious to a person having ordinary skill in the art at the time the invention was made to have modified the invention of Leung with the teaching of Yegin to update packet routing information on a roaming client through registration process.” (see Office Action at page 3). However, Yegin discloses the same registration process as described in Leung. (see e.g. Yegin at col. 1, lines 65-66; Leung at col. 1, line 64 – col. 2, line 57). Specifically, Yegin states

that the purpose of performing the L3 handoff operation is to update packet routing information on a roaming client through a registration process. Thus, Yegin does not modify Leung in any way, because both cited references describe the same known L3 handoff procedure of mobile IP networks.

As discussed in the Specification, embodiments of the present invention relate to a mechanism carried out for a roaming mobile node that has already performed the registration of the care-of address with the home network (i.e. the L3 handoff procedure). (see Specification at paragraphs 0021-0022). In other words, the mobile node is already addressable at a so-called care-of address. Alternatively, the registration of the care-of address with the network needs to be carried out in connection with the correspondent registration. Thus, Leung, even if modified with Yegin, is directed toward a different procedure than embodiments of the present invention.

Therefore, for at least the reasons discussed above, the combination of Leung and Yegin fails to disclose, claims 1, 17, 26, and 31. For the reasons stated above, Applicants respectfully request that this rejection be withdrawn.

Claims 2-12 depend upon claim 1. Claims 18, 21-25, and 32 depend upon claim 17. Thus, Applicants respectfully submit that claims 2-12, 18, 21-25, and 32 should be allowed for at least their dependence upon claims 1 and 17, and for the specific elements recited therein.

The Office Action rejected claims 13-16 and 19 under 35 U.S.C. §103(a) as being allegedly unpatentable as obvious over Leung in view of Yegin, and further in view of

Gehrmann (U.S. Patent No. 6,912,657) (“Gehrmann”). The Office Action took the position that the combination of Leung and Yegin discloses all the elements of the claims with the exception of “wherein the authenticating comprises authenticating the correspondent node by means of a certificate-based authentication protocol” with respect to claim 13; “wherein the authenticating comprises authenticating by means of the certificate-based authentication protocol comprising an internet key exchange protocol,” with respect to claim 14; “wherein the authenticating comprises authenticating by means of the certificate-based authentication protocol comprising a transport layer security protocol,” with respect to claim 15; and “wherein the authenticating comprises authenticating by means of the authenticating step comprising certifying the identity information cryptographically,” with respect to claim 16. The Office Action then cited Gehrmann as allegedly curing the deficiencies of Leung and Yegin. (see Office Action at pages 7-9). The rejection is respectfully traversed for at least the following reasons.

The descriptions of Leung and Yegin, as discussed above, is incorporated herein. Gehrmann generally discloses an optical device at a first device which reads a public key that is encoded to a graphical string at a second device, which key is required for establishing security. (see Gehrmann at Abstract).

Claims 13-16 depend upon claim 1, and claim 19 depends upon claim 17. As discussed above, the combination of Leung and Yegin does not disclose, teach, or suggest all of the elements of claims 1 and 17.

Furthermore, Gehrmann does not cure the deficiencies in Leung and Yegin, as Gehrmann also does not disclose, teach, or suggest, at least, “indicating that a correspondent registration process needs to be performed for a mobile node for which a home network registration process has been performed or needs to be performed with its home network, thereby to register current network address of the mobile node with the home network,” “wherein the correspondent registration process includes transmitting a binding update to a correspondent node of the mobile node,” “authenticating the correspondent node in response to the indicating, the authenticating yielding identity information about the correspondent node,” and “determining whether the correspondent registration process is to be carried out, based on the identity information,” as recited in claim 1; and “an indicator configured to give an indication when a correspondent registration process needs to be performed, wherein the correspondent registration comprises transmitting a binding update to the correspondent node,” “an authenticator configured to authenticate the correspondent node, the authentication unit being responsive to the indicator and configured to yield identity information about the correspondent node,” “a correspondent registration unit, responsive to the location privacy decision unit, configured to carry out the correspondent registration process,” and “wherein the binding unit is further configured to perform a home network registration process with a home network of the apparatus, thereby to register current network address of the apparatus with the home network,” as recited in claim 17.

Thus, the combination of Leung, Yegin, and Gehrman does not disclose, teach, or suggest all of the elements of 13-16 and 19. Additionally, claims 13-16 and 19 should be allowed for at least their dependence upon claims 1 and 17, respectively, and for the specific elements recited therein.

The Office Action rejected claim 20 under 35 U.S.C. §103(a) as being allegedly unpatentable as obvious over Leung in view of Yegin, and further in view of Forslow (U.S. Patent No. 6,954,790) ("Forslow"). The Office Action took the position that the combination of Leung and Yegin discloses all the elements of the claims with the exception of "wherein the authentication unit comprises a domain name system-based protocol for obtaining the identity information. The Office Action then cited Forslow as allegedly curing the deficiencies of Leung and Yegin. (see Office Action at page 9). The rejection is respectfully traversed for at least the following reasons.

The descriptions of Leung and Yegin, as discussed above, are incorporated herein. Forslow generally discloses a network-based mobile workgroup system. The mobile workgroup system is an access management system for mobile users with VPN and firewall functionality built-in. All workgroup policy rules are defined in a mobile service manager and pushed down to one or more mobile service routers for policy enforcement. The mobile service router closes to the mobile client performs regular authentication checks of the mobile client during service execution. (see Forslow at Abstract).

Claim 20 depends upon claim 17. As discussed above, the combination of Leung and Yegin does not disclose, teach, or suggest all of the elements of claim 17.

Furthermore, Forslow does not cure the deficiencies in Leung and Yegin, as Forslow also does not disclose, teach, or suggest, at least, “an indicator configured to give an indication when a correspondent registration process needs to be performed, wherein the correspondent registration comprises transmitting a binding update to the correspondent node,” “an authenticator configured to authenticate the correspondent node, the authentication unit being responsive to the indicator and configured to yield identity information about the correspondent node,” “a correspondent registration unit, responsive to the location privacy decision unit, configured to carry out the correspondent registration process,” and “wherein the binding unit is further configured to perform a home network registration process with a home network of the apparatus, thereby to register current network address of the apparatus with the home network,” as recited in claim 17.

Thus, the combination of Leung, Yegin, and Forslow does not disclose, teach, or suggest all of the elements of claim 20. Additionally, claim 20 should be allowed for at least its dependence upon claim 17, and for the specific elements recited therein.

For at least the reasons discussed above, Applicants respectfully submit that the cited prior art references fails to disclose or suggest all of the elements of the claimed invention. These distinctions are more than sufficient to render the claimed invention unanticipated and unobvious. It is therefore respectfully requested that all of claims 1-26 and 31-32 be allowed, and this application passed to issue.

If for any reason the Examiner determines that the application is not now in condition for allowance, it is respectfully requested that the Examiner contact, by telephone, the applicants' undersigned representative at the indicated telephone number to arrange for an interview to expedite the disposition of this application.

In the event this paper is not being timely filed, the applicants respectfully petition for an appropriate extension of time. Any fees for such an extension together with any additional fees may be charged to Counsel's Deposit Account 50-2222.

Respectfully submitted,



Majid AlBassam
Registration No. 54,749

Customer No. 32294
SQUIRE, SANDERS & DEMPSEY LLP
14TH Floor
8000 Towers Crescent Drive
Tysons Corner, Virginia 22182-2700
Telephone: 703-720-7800
Fax: 703-720-7802

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